UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

LOOSE-LEAF FIELD NOTEBOOK

9-157

7

Home 703-938-7966
702 Battle St., SE
Vienna, Va 22180

EMH-2956

Mrs M. R. Watt
1030-14 St
Douglas Arizona 85607

817-888-3171 rm 17

CE 2-8082

3
750
7
5250
25
26250

52.50
2.62
55.13

379

127

Oregonite

851 LINDEN PIT

Woodbridge Clay mbr
of Raritan Fm

— Sayreville, N.J.

Fossil leaves

in Brown mudst
at base of dark
grey clay filled
cut-off meander

leaves in lowest 6" of
chocolate brown laminated
silty claystone at base
of clay plug

SS. med. to coarse grained
micaceous in places

clay

652 SE of Linden Pit across RR

Leaves w/ cuticle in a clay plug

July 8, 1985

Flight to Haughton Astro.
from Resolute.

Doug McLeod IN ——

Beautiful weather 45°
8,000' scattered.

All luggage & camp gear
packed
1-Drum Av. gas for helicopter

Devon appears sl. higher on
east side & slopes to W.

July 8, 1985

853 windy - temp. 45° to sunny

Haughton Astroblème
sampling a peat for
KKT + Bill Gravstein
Sample taken from a
peat that has been
dissected by a
more recent drainage

853a First sample
permafrost at
20 cm.

top of peat is exposed
& forms a small
terrace

853b A second sample from
3' ~~north~~ west of 853a
located on
photo A 16747-22

Permafrost 22 cm.
in 853b.

7/8/85

853 C Same site sampled for pollen, megafloor & fuss C^{14}

854

Resampling loc 845a
Fruit & seed loc
of previous summer

854a also pollen sample 854a
Twigs, leaves, in a silt

Pollen sample 854a comes from
a lens of brownish
grey clay in ~~in~~ the
~~twigs~~ silt beneath the twigs.
Possible peat bed?

PX

July 9, 1985
Haughton Astrobleme

855 Type Section Creek
about 1/8 mile above
confluence w/ Rhinoceros Cr.

Ejecta Blanket.
Samples of Gneiss from
ejecta blanket.
These have been moved by
the stream.

7/9/85

856 Gneiss samples from "The Grave"
outwash of the ejecta blanket
about 1/4 mile w. of 855
at confluence of two un-
named creeks

Dirty gneiss. Gneiss about half the
weight of normal gneiss +
w/a frothy appearance.

July 10, 1985

waiting for Helicopter WXJ

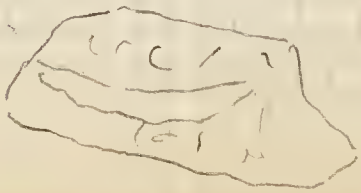
weather E2 ϕ E 20 ϕ
W 00 at 00 Temp. 10°C

Helicopter Arrived at 17:50
HMS. 1:26 from RCS
this later named Sand Bluff (2/27/85)

857 S.E of original mass about 2 km.

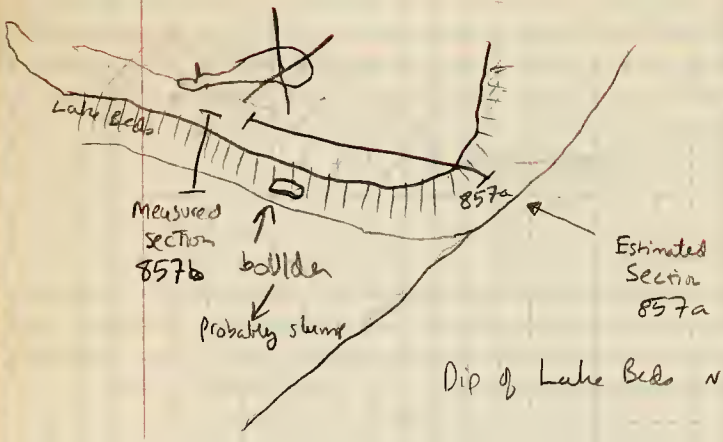
coarsly varved at 3-5 cm
tannish grey silt w.
silty brownish grey
PX2 clay interbeds.
in a cliff about 25' high.

5' Angular block of Is. on the
lake beds ~~bec~~ at this pt
PX 3-a4 Is is vesicular from impact
Float that has dropped down over
surface



Lake seds

857 Measured Section in Haughton



pollen samples
857c
857d
(in section 857b)

Dip of Lake Beds N 0°

LJH picture 5

Section 857a from river colluvium, base of lake beds to base of helicopter platform at top of lake beds

8 LJH height of eyes minus 1 foot.
= 13.0 m

1 Shovel handle = 520 mm

13.4 m
-.3
13 m

Section 857b detailed measured section from slump above river to top of slope by helicopter

Unit	Thickness in M	Description
1	0.11	base in slump from cliff Yellow brown mudstone, upper contact irregular
2	1.0	tan fg sa ss massive at base becoming bedded, above 1¼ s.h. it becomes ripped, grading to next unit

Section 857 b continued

Unit No.	thickness	description
3	0.2	grayish brown massive mudstone pollen sample 857c
4	0.6	interbeds of tan vfg a or sa ss and dark grayish brown mudstone laminae, Mudstone about 1/4" thick. SS interbeds ~ 6" thick
5	0.5	[illegible] tan siltstone and fissile grayish brown shale in 1-2" interbeds
6	1.0	[illegible] siltstone tan and brownish gray mudstone 1/4 to 3/4 inch beds photo 6 - solifluction has bent the beds giving the appearance of crossbedding
7	1.4	1/8 - 1/4" varve / siltstone (tan) with ferrugeno yellow-brown mudstone, varve becoming thicker and thinner. irregularly above 0.8 with siltstone units thickening to 1 inch above this point Pollen sample 857d
8	1.6	[illegible] Unit has become a 1/2-1 inch bedded grayish vfg a-sa ss w/ mudstone laminae Above 1 shovel handle, the unit is all siltstone top of section in gravel beach.

JUN 10 1785

July 10, 1985
Sunny & windy 45°F

858 E. wall of S. End of Vicks Fiord
Devon Is. 75° 48' N; 91° 07' W.
~~Bear Bay Quadrangle~~ (1:250,000)

So called Eureka Sound Fm

Sequence of white sand lenses

in a interbedded lignitic &
SS. interval.

Downfaulted into Silurian.

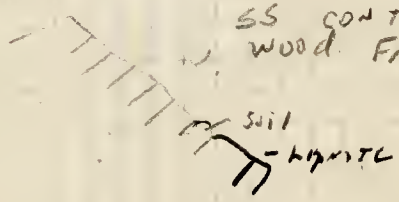
858a Pollen sample
From dark grey sandy
lignite at top of hill.

858b From a dark grey carbonaceous
mudstone 50' lower. mudstone
2' thick lies above a 50' light grey
SS. w carb laminae (appear 11 laminae)
Section dips 45° to east

E ←

SS contains lignetized
wood frags.

PX 19.



100' lower 1' thick tan indurated
SS w vertical roots

PX20 Podzol

Sequence is as follows:

7/10/85

858 (CONTINUED)

UP

~~25' - white channel below sample 858b~~

50' Lignite ~~Ma~~ Interbedded mudst siltst

30' ~~Carb~~ grey SS w carb ~~Sil~~ mudstone stringers + lignitized wood

3" clay Fe stone

1' Iron weathering indurated SS w vertical root molds (Paleosol)

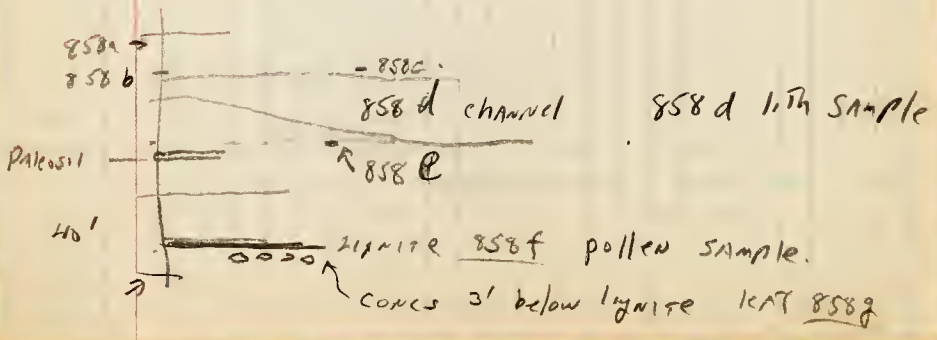
10' massive unind. grey micaceous SS

40' to Carb siltst, mudst interbeds
Lignite at 20' from base pollen sample 858 f

The white 25' channel of this section is probably Kirk's channel from which come

pollen 858 c may be nearly equivalent in strat level - wood frag.

858 d ~~unless in middle of~~ in slope at level equivalent to 3" ledge of Fe stone in this section



7/10/85

809 VICKS Fiord 75°47'N; 91°11'W
West side of Stream Valley

Fiord Bottom seds dissected by stream
mya Truncata & 3 other.

Helicopter Hrs.

1.2 hrs.
2.0 hrs.
1.4 hrs
4.6 hrs.

8510 - Cut bank in impact breccia NW of Camp on the east bank of Type Section Creek.

Good exposure of breccia with in situ gneiss clasts.

SAMPLES.

marked on Photo 16747-22

7/11/85
SUNNY warm 56°

8511 Haughton Fm. Lava x
ON ~~Fruity seed~~ Sand

Dip & STRIKE measured here
S abt. 5° Dip 30° E

PLANT 6001 Dandylion
Dry sandy bare upland
w/ Poppies, Sorrell
sparse grass.

6002 MUSTARD w/ Dandylion

a b

7/11/85

8512 Resampling type section of Haughton Fm. Section 8457

Dollen	Sample						
8512	a -	in	unit	1	of	Sec	8457
8512	b	"	"	2	"	"	"
8512	c	"	"	3	"	"	"
8512	d	"	"	4	"	"	"
8512	e	"	"	5	"	"	"
8512	f	"	"	6	"	"	"
8512	g	"	"	7	"	"	"
8512	h	"	"	8	"	"	"
8512	i	"	"	9	"	"	"
8512	j	"	"	10	"	"	"
8512	k	"	"	11	"	"	"
8512	l	"	"	12	"	"	"
8512	m	"	"	13	"	"	"
8512	n	"	"	14	"	"	"
8512	o	"	"	15	"	"	"
8512	p	"	"	16	"	"	"
8512	q	"	"	17	"	"	"
8512	r	"	"	18	"	"	"
8512	s	"	"	19	"	"	"
8512	t	"	"	20	"	"	"
8512	u	"	"	21	"	"	"
8512	v	"	"	22	"	"	"
8512	w	"	"	23	"	"	"
8512	x	"	"	24	"	"	"
8512	y	"	"	25	"	"	"
8512	z	"	"	26	"	"	"

8/11/85

8513 Isolated Hill of "Cliff Sand"
~~on strike to~~

STRIKE ON PHOTO

Dip 3 1/2° E.

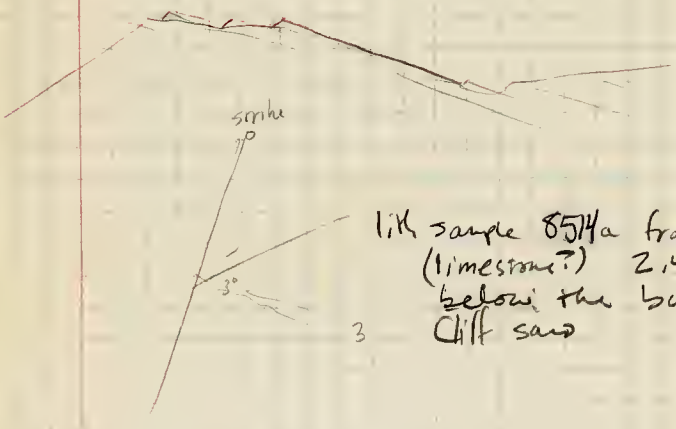
8514 Interval Section from stream which flows on surface of breccia blanket at SE corner of lake bed deposit.

Much of this lithology was described in 1981

Level set at 3° N

UNIT	Thickness	Description
1	—	base in stream drainage on blanket of unmodified ejecta blanket that dips inward into crater
2	5.7 meters	blanket of mixed breccia and lake bed debris, possibly lake reworked breccia
		CONTACT
3	7.4 meters	Haughton Lake Beds homogeneous gray weathering siltstone
4	15 meters ~~HH HH HH~~ offset at 8 meters change to 1 1/2° from 3°	prominent slope forming siltstone ironstone nodules Platy flat gray weathering concretions 3" thick w/ fish and bird bones at 4.3 m. limonite at 2.6; 3, 5.8, 7.8'

Unit	Thickness	Description
		section continues over rubble hill



lik sample 8514a from slabby (limestone?) 2.4 meters below the base of the Cliff sand

	15.2	To base of Cliff Sand from top of unit 3

Total from Lower Contact to Base of Cliff sand is 22.6 m

Traverse from Locality 5 Bunny beds up to base of Cliff sands 4.9 meters

||

We then traverse over to the debris flow section 8455 where we determine that the white sandy units is at the debris flow and beneath the Rhino hill.

8515 interval section from base of the white sandy member to the Cliff Siltstone

Units - Leo's Height of Eye = 5.5 ft.
dip set at 1/2° N

Unit	Thickness in H.I.	Description
1	~~IIII~~ ~~IIII~~	White sandy member extends from base to 4.5 H.I.
		Traguled at 8 H.I. (entry as 6)
		platy red concretions between 8 and 9

10 H.I. equals ±55 feet from stream at base of white Sandy member to base of Cliff sons near Rhino hill

7/11/65

Haughton Astrobleme

8516 Rhino hole loc.

marked on previous photos

7/12/85

Camp move to Bay Fiord
From Haughton

Russ in twin otter

Came at 10:10

Arrived at Bay at 12:35

Flew by way of Thomas Lee Inlet
E. of Grinnell Peninsula
Hell Gate
Blind Fiord
Bowman Fiord
Starfish Bay
Stratheona Fiord.

Brought mail, extra tent pole

Camp day, Lunch outside in
65° weather.

7/13/85

Bay Fiord on Matthew Peninsula
in Member III on east limb of
8517 syncline.
marked on photo A16606-85

walked up a spur to this pt.
down section out of Member III

section consists of dun colored
soft marls or mudstones,
interbedded w platey ls. w/
mud cracks (rare rain drop
impressions) poor equisetum &
another ll veined plant impression,

This station is a tabular x-bedded
to massive f.g. limey ss.
lt. yellow grey
Dip. between 23-40° Av. 30°

7/13/85

Sunny 55° windy

Mbr III about 300' below contact w/ member IV

8518 Ledge of dunn colored med. grey ls. laminated

~~meta~~

Equisetum rhizomes ∥ to bedding + ⊥ to it (some w/ rhizomes at nodes)

metasequoia foliage

Elatides ~~(cryptomerioid foliage)~~

Cone scales

px standing tree trunk.

Cupressaceae ~~Thujites~~ sp. small branchlet

Ledge 4' thick

8518 b Pollen sample from thin lignite, adjacent underclay (grey) and overlying plastic clay - yellow grey.

- superadjacent clay 3'
- lignite 2-3'
- underclay 5"

CONFIDENTIAL

In superadjacent clay are found small pelecypods (nuclea ?) an operculum + a very poor angiosperm leaf.

8518 b 2 HI above 8518

7/13/85

Mbr III

8518 C 21.75 HI above 8518
in second of 2 4' ledges
of Calcareous paleo sol
containing roots & Equisetum
rhizomes.

Dip is 56% to W.

8518 d Pollen sample from lower
in Mbr III

—

from highly carbonaceous
silt

From this pt. upward to 8518
unit consists of
interbedded calc ss ledges
freq. x-bedded & w/ upper
surface ripple marked

unconsolidated med. grey siltst
& mudst all of which
appear calc.
Plant remains & paleosols
only become abundant
~~also~~ at ~~abt~~ level of 8518.

Dip here 67% to W

9 HI to base of prominent
flat bedded ss (ledge forming)
beds obscurly ripple marked
11.5 Top of ss

~~10~~ 20 ~~30~~ ~~40~~ 50 ~~60~~ ~~70~~ ~~80~~ 90

100 + 2.4 HY

7/13/85

8518 CONT'd

70.2 BASE of 20' ledge of SS. massive in middle flaggy at top & bottom.

8518 d is 102.4 HI Below 8518.

from 8518 b (upper ~~tex~~ pl. horizon) TO COAL.

HT
10 20 30 40 50 60 70 80 90 100 110
120 130 140 150 + ~~160~~ 3.5

TO BASE of 25' thick coal in base of Mbr III.

[redacted] 7/14/85

ON NORTH ~~shor~~ COAST of FOSSIL BAY

8519 mbr III ~~just below~~ 25' conglomerate
marking ~~bdy of mbr~~ top of
mbr III

mbr IV

Congl. w/ is c/ALTS some
orthoquartzite
gneiss } rare

bed abt 3' thick.

Conglomerate marking the upper bdy. of
member III

w/ Lisa Tauxe
Greg
David
Mary Dawson
Cliff Morrow
Harry Thurston - Reporter - Writer Equinox
Gail Harvey - Photographer

7/14 & 16/65

N. Shore of Fossil BAY

8520 Member 4

about 200' below 50 m
coal ~~in~~ m at base of main
section

~~Ph~~ PLATANUS nobilis
Cercidiphyllum

IN CLAY IRONSTONE

Acer
Glyptostrobus or Taxodioid conifer
Cone
Vinea ?
METASEQUOIA

Dominance NOT w/ Conifers
& Cercidiphyllum.

7/16/85

8521 North Shore of Fossil BAY
= Mary DAWSON 85-4

Member IV E S Fm.

Limonite cones w Platyomenid
Skull + plants including:

Cercidiphyllum
Metasequoia
Taxodium? cones + Foliage
Acer
Platanus nobilis
possible Nelumbo (but needs checking)

Skull discovered by Cliff Merrow
about 11:25 am

Elevation of
Fossil Skull Above 50 m COH

18 HI + 2.25 m.

7/16/85

8522 Skull site

Unconsolidated lt. grey sand
w ~~clay fe sn~~ limonite
concs. Mbr IV

Skull looks like a carnivore

* site about 25 m above
the top of the 50 m coal
near the base of the section

associated w
Metasequoia
Cercidiphyllum
Platanus nobilis

7/17/85

8523 Clinker Hill to the NW of Camp
Mbr IV

Vinea
Chaeroptelea
Platanus raynoldsi
Acer
Metasequoia

7/17/85

8524 Clinker Hill at the Bay Fiord Camp
Mbr IV

Platanus nobilis

Petrified wood.

7/17/85

Camp DAY in morning

LAST Interview w/ Harry Thurston
Bid Adieu to Kirk who was
given bed rest in Resolute
for a strained back

Helicopter PSN arrived at 1:10 pm
and we took off at about 1:30
Picked up Lisa on her "Marie View"
section on NW nose of Syncline

Checked out Mbr III - IV Transition
on nose of syncline and found
that we could get from III into
basal IV w/ magnetic section

Then we flew to Troelson Peninsula
and Checked out Mbr II and
III there.

Mbr II looks good w/ many molasses
giving excellent prospect for
magnetics.

Looked at Mbr IV - III Transition
on the cliffs of the south shore
and found this not so good for
magnetics though not hopless.

Then flew back to camp

Dave + Greg had trouble w/ the
mopeds. So we had a late
dinner 10:44 and so to bed.

7/17/85

8525

Petrified Forest
on Fossil Forest River

Northing map at loc 79696

Nearest pairs distances
between stumps

Group 1

6'7"	10'1"	12'8"	9'6"
12'5"	10'2"	15'3"	~~17'~~
4'4"	12'10"	13'7"	~~11'10"~~

Group 2

17', 11'10"

Group 3

7' 5", 12'

Group 4

8'3", 17'5", 8'3", 24', 23'4"

stump diameters (decimeters)

7, 5, 10, 6, 6, 5, 8, 5, 10, 3

6, 3, 4, 5, ~~5~~ 4, 6, 5, 13, 4, 7

7/18/85
Sunny & Warm
650

8526 Yellow site above
8525 about 150 m STRAT

Dark grey silt above
a 6" coal.

Loc 8525 Again

About 20 m above the ~~the~~ Fossil Forest is found large chunks of bone Some may be Turtle but other may be ~~tary~~ mammal or even dinosaur
In any case this is the oldest bone found in the E.S. Fm as it appears to come from the basal part of Member ~~III~~
This is a rusty looking ~~member~~ unit w some coals & clay Fe stones but is ~~no~~ ~~[illegible]~~ most similar to mbr III in basal part. Similar sections are found ~~toward~~ at the base of Lisa Fauxe's Marie View section and between II & III on the southwestern face of Troelson Peninsula.

Mary's Field notes for 1979 indicate that ~~bone~~ tooth fragments were found here but do not specify it what type.
Very exciting if this could give Paleocene mammals or Dinos.

loc 8525 Contd.

The section containing the wood & bones ~~is~~ is underlain by Mbr II (to west) and overlain by typical Mbr III beds in the exposures to the ~~west~~ east.

7/18/85

8527

SUNNY + NICE
65° F

STENKUI Fiord.
BASE of STONEWOOD HILL
NEAR BASAL CONTACT of MBr IV

Dip 12° SW STR ON photo
A16685-46

STR NEARLY due (S.)
STR ON Dip slope of
UNIT 4 of Sec 8421

PX 18919. SECTION ON STONEWOOD HILL
S FACE SHOW BONE BEARING
SAND + COALS below IT

NOT LENTICULAR forest
LAYERS IN COAL.

7/18/85

STENKUL Fiord.

SECTION 8528

SECTION STARTS in upper part of Mbr III of The EUREKA Sound Fm.
level set at 2970

UNIT	Meters Thickness	Description
1	2.1	medium grained brownish gray sr ss. with carbonaceous material on laminae.
2	1.8	fissile gr. shale - pollen sample 8528a
covered interval	9.0	
3	3.9	dk.gr. carbonaceous fissle shale with stringers of lignite.
4	2.2	tan laminated siltstone or mudstone breaking into thin plates ~ forming prominent ledge.
5	4.7	vfg sr silty ss with thin parallel beds forming swale, weathering tan; color dk. tan.
6	11.3	pollen sample; dk. gr. fissle shale forming swale; carbonaceous, with stringers of coal up to 10cm thick in basal part. pollen to be taken 8528 UNIT (6) At 6.1 stringer of .2m thick tan siltstone forming weak ledge at top of slope.
7	3	gr. tan siltstone forming shoulder

unit	thickness meters	description
8	2.3	same lith. as 6
		level at 18 %
9	1.8	ledge of rusty yellow weathering platy medium gray ledge-forming siltstone; bedding marks present.
10	3.4	friable fg to vfg sr clayey ss mottled brownish to yellow gray.
11	3.0	fissile carbonaceous shale, some lignite stringers
12	3.1	coal
13	0.6	fissile dk. br. shale, grading upward to
14	3.2	brownish vfg sr ss with carbonaceous laminae & some shale interbeds similar to those in previous unit.
15	5.3	stonewood coal
16	1.5	= unit 2 of section 8426 - siltstone bearing leaf impressions

THE END
SCHLUSS
FINI

7/19/85

Stenkul Fiord
Helicopter Traverse

Up valley of Stonewood River
~~wt~~ west side

~~fast~~
ES Fm under Dob s. of
mapped fault contact on
W. side of river

note patch of ES. in NE
quadrant of photo 16685-46

Returned via Bauman Fiord Fuel Cache
11 Verdume Fiord W of first
range of mts. to west of it

Across Braskaud's Plain

To ~~Thalas~~ Thalassa River to
Fossil Forest River & Dine
site of yesterday

Found Dine frags to top of
exposure from about 40'
below fossil forest. level.

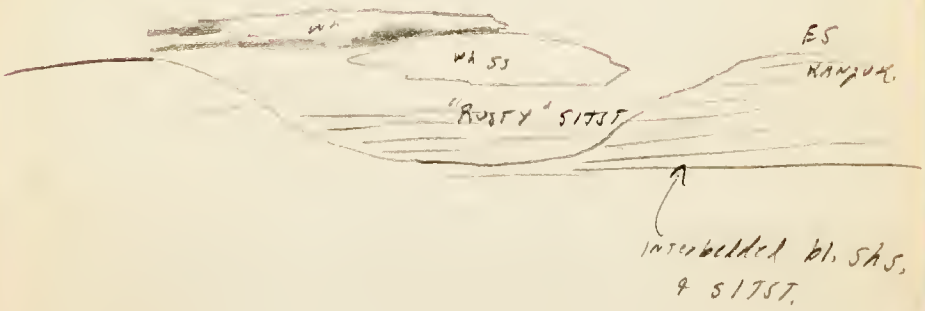
7/20/85
Fog, Drizzle in Am.
⌀ in P.M.

8530 ~~AT~~ IN SATURATED Soil at head of drainage just west of Red Hills Camp at BAY Fiord

Soil SATURATED in SWAMP w/ moss willow

8531 IN Soil developed on Coal seam on an upland 150 m S of Red Hills Camp at BAY Fiord 78° 45.5' N

CONTACT KANJUK / ES is irregular



7/22/85

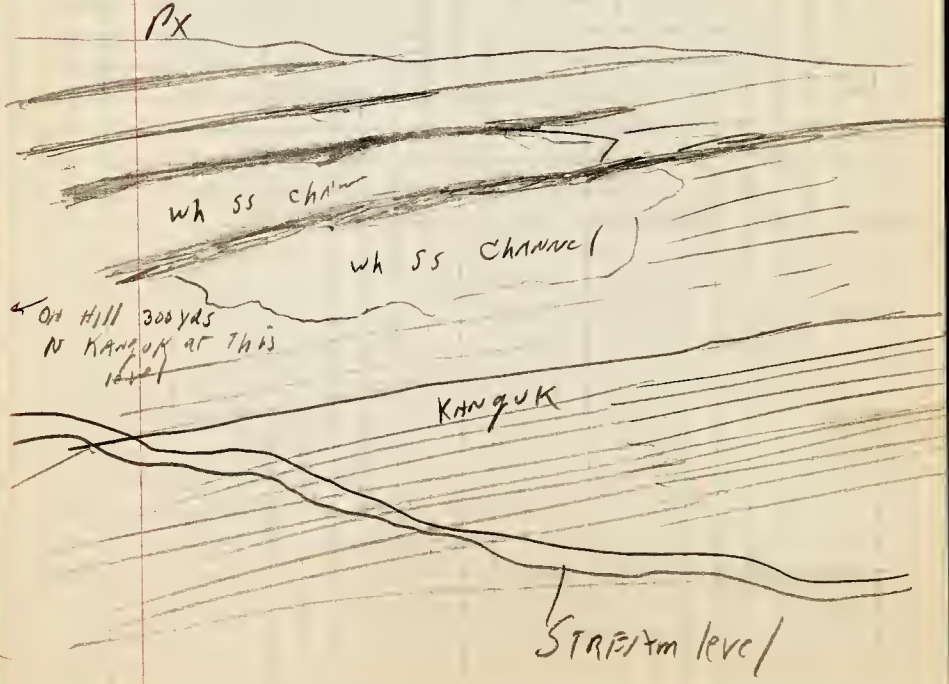
KANGUK / E.S. CONTACT P.C. + cold w/ wind

8532 ON Remus Creek
at Thorsteinsson + Jozer
loc 143

abt, 1 mi above Campsite

Channel of E.S. Mbr 1
white SS underlain by
rusty SITSTS + overlain
by coals + mbr I

Same liths as elsewhere in
Mbr I



7/22/85
windy

8533 Kanguk to Mbr I Transition

Kanguk Bl shales

with a large channel of wh
SS similar to Mbr I
but w KK bl. shs. above it

many clay fe stone concs
~~channel~~ above ~~th~~ channel

Predominantly KK lith to top of
cliff.

8534 Per. wood in Mbr I above
indurated white SS.

Poorly preserved in limonite
but weak growth rings
seen (result of preservation
not original prior development)

7/22/85

Sec. 8532 KANGUK / Mbr I on Remus Cr.

SECTION dips at abt 60°

UNIT NO	THICKNESS	UNIT & DESCR
		KANGUK Fm
		BLACK SHS & GREY SLTST. Some lenses of LT grey SS in upper 200-400 m. also lenses of clay Fe STONE up to 8"
X		Section 9 TARIS at ITK / Mbr I Bdy. (projected.)

Eureka Sound Fm.
Mbr I

unit	thickness in H.I. (supplemented by metric)	description [dip is 62° E.]
1	20+2.5m	yellow tan parallel laminated flaggy clay-rich fg sa ss forming shoulder, some limonite stained layers becomes more massive in last 2 meters & shows some tabular x-bedding
	.3m	mg sa ss with carb. laminae
2	1m	coal
3		parallel 1cm. rusty ~~gelb~~ brown ss with shale interbeds becoming predominant toward middle. Thickness of interbs 1-5cm. Above medgrnt shale

8532

	3 - 0.2m	lamination less numerous
4	2 + 0.2m	for shale
5	22	interbedded limonite yellow to brownish gray ss & shale, ss with irregular bedding & iron stone layers, bedding is tabular; mudstone included in interbeds. Fossil remains 6.
6.	44	massive light yellowish gray mg ss with several thick (2 - 3m) coal interbeds lowest coal ~~unit~~ bed at 22 (+thickness 4). At 44 base of 2nd coal.
7	1.7m	Coal
(note: now Abney level, 26°70.		
8	1.5.	Grey shale; at 1.5 fg sa ss ~~tabular x-bedded~~ & parallel
9	1 + 0.8m	laminated.
10	.5m	coal
11	.7m	grey carb. sh.
12	2 + .5m	lt. yellow grey ss, friable & rolled laminated with carb. particles on laminae fg.

8532

13	1.2 m	lignite
14	0.6 m	cong & coarse sand (0.6 m)
15	8 + 0.9 m	grade upward into parallel laminated light yellow & gray sandy grit & coarse to medium ss.
16	1.4 m	lignite
17	4 + 1.2 m	ss lt. yellowish gray trough & tabular X bedded ss with dry Fe nodules in upper 3 m.
18	3.5 m	coal
19	3 ss grades upward into	lt. yellowish gray fg ss trough X-bedded with carb debris on laminae. At 3 have interbedded
20	8 - 0.1 m.	ss, siltstone ~~and~~, lt. gray to sandy brown with thin beds of lignite up to .4 m & clay Fe concs. Unit ~~present~~ parallel bedded ~~appearance~~, beds 1 cm to 1 dm.
21	2 m	lignite, in covered interval
22	8 + 0.8 m	series of interbedded mudstone & ss, yellow gray

8532

		to brown with thin coals, frequently slumping.
23	1m	coal
24	1.2m	massive gray mudstone
25	1.5m	lignite, shale, interbeds
26	0.5m	pollen sample 8532a in 0.5m shale with conifer needles & rare angiosperm frags.
27	0.7m	lignite
28	0.6m	massive gr mudstone
29	2.5m	coal
30	8	yellow gray fg ss parallel & massive with wood frags. & carb. trash on some bedding planes
	dip 125 70 →	
31	10 + .2m	interbedded lignite, ss, mudstone, some clay Fe stone; weathers yellow gray
32	.8 to 2m	lenticular clay .8 m to thickening to 2m to W.
33	2.8 m direct measurement in dip	return to lithology of unit 31

E532

34	drift mess. 1.5m	lignite interbedded with clay Fe stone in levels up to .3 m thick
35	9 level pacing at 60 to dip	ss, yellow brown friable, v fg to fg.
36	16 level pacing	lignite & mudstones, ss, frequently slumped
	8 level pacing	friable ss

Beyond this point section becomes extensively slumped & unusable.

End of Section

7/23/85

Clear, Sunny
High 19°C
mosquitoes!

8536 Mbr II E.S. Fm.
20 yds N. of
~~At~~ old 7936

Tundra fied outcrop of alternating

Lignite, mudstone shale, w/
clay Fe stone all a
dark brownish grey color.

~~nodull~~ nodules w very poor x
scrappy plants:

metasequoia
Platanus raynoldsii

8537 mbr I E S Fm.
Valley w of 8536
White sand patches poor
exposure

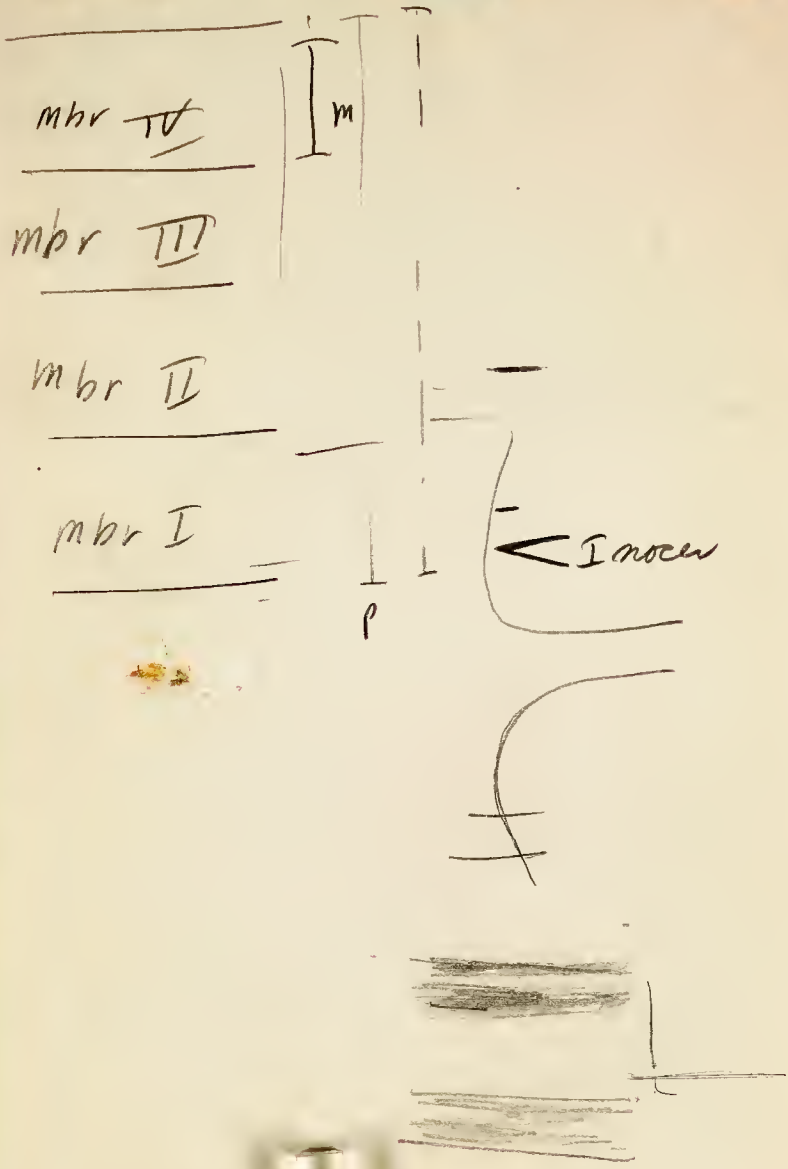
Quartz pebble ~~sand~~ quit
& Congl. ss

Corals
Amethyst & Rock xl as rare
components.

7/23/85

8538 Soil samples for KKT + W. Graustein
on west Bank of Remus Creek
~~on a~~ from a Tundra soil
developed on a Terrace
20 feet above the Creek

Good rich loamy soil on a
well drained Tundra with
large polygons developed on it
Appears to have a high organic
component


mbr IV
mbr III
mbr II
mbr I
m
p
Inocer

PATRICK McGAHRIN

BANK STREET

OTTAWA

Northern Bodies.

Close to Lansdowne Pin.

Helicopter Hrs		OTTER
7/7/85		2.4
7/10/85	4.6.	2.1
7/12/85		3.0
7/17/85	2.6	1.0
7/18/85	2.6	

Lee Pierce
Tanager Lodge
Merrill, N.Y. 12955

7/19/85	5.5		
7/21/85		4.0	12.5
7/23/85	0.5		

Grain-size Scales

By Roy L. Ingram, University of North Carolina

GRAIN-SIZE SCALE USED BY AMERICAN GEOLOGISTS

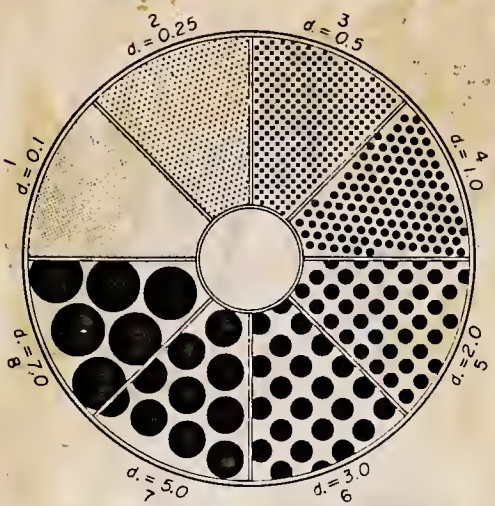
Modified Wentworth Scale — after Lane, et al., 1947, Trans. American Geophysical Union, v. 28, p. 936-938

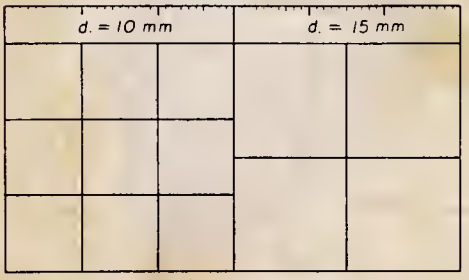
phi	mm	GRADE LIMITS mm	inches	U.S. Standard Sieve Series	GRADE NAME		
−12	4096		161.3				
−11	2048		80.6		very large		
−10	1024		40.3		large	Boulders	
−9	512		20.2		medium		
−8	256		10.1		small		
−7	128		5.0		large	Cobbles	
−6	64		2.52	63 mm	small		GRAVEL
−5	32		1.26	31.5 mm	very coarse		
−4	16		0.63	16 mm	coarse		
−3	8		0.32	8 mm	medium	Pebbles	
−2	4		0.16	No. 5	fine		
−1	2		0.08	No. 10	very fine		
0	1		0.04	No. 18	very coarse		
+1	1/2	0.500		No. 35	coarse		
+2	1/4	0.250		No. 60	medium	Sand	SAND
+3	1/8	0.125		No. 120	fine		
+4	1/16	0.062		No. 230	very fine		
+5	1/32	0.031			coarse		
+6	1/64	0.016			medium	Silt	
+7	1/128	0.008			fine		
+8	1/256	0.004			very fine		MUD
+9	1/512	0.002			coarse		
+10	1/1024	0.001			medium	Clay size	
+11	1/2048	0.0005			fine		
+12	1/4096	0.00025			very fine		

Graph for Determining the Size of Sedimentary Particles

by the Data Sheet Committee, aided by George V. Chilingar

DARK PARTICLES





Place sand grains or rock particles in the central pert ot the circle. Compare the size of the particles with those on the graph with the aid ot e magnifying gless. Record the corresponding number (1, 2, 3, 4, 5, 6, 7, 8) in notebook. For samples with particles of varying sizes, record the most common size first.

July 29, 1985 Leo Hickey + I

Measured Section 8540 (transcribed from Leo's book)

(conversion to feet based on 1 m = 3.3 ft.)

Unit no.	thickness	total	description
1	37.9 m	37.9	dip 90° INTBD DK GRAY SHALE AND TAB YELLOW-RED. BROWN MED GR. SS ⊼ P ⫽ SS + shale beds up to 10 m underlain by black shale
2	54.5 m	92.4	Black Kanguk shale
3	15.2 m	107.6	Med. grained, well-sorted orthoquartzite, no feldspar shale split in middle wavy top and bottom
4	92.1 m	199.7	Black shale, slightly coaly at base; 15-20 cm sandy splits; brown in places POLLEN 8540a at base
5	31.8 m	231.5	SS, yellow-brown; med grain orthoquartzite; greenish stain on bedding plane (as at Mosquito Creek); sub rounded to rounded beds 1-3 m thick 3 major beds 8 m SS 4½ m coal 5 m SS ~5 m shale 5 m SS
6	151.5 m	383	Black shale; INTBD dk gray 1-3 cm shale + brownish mudstone; looks marine POLLEN 8540 b at 91 m shale >> mudstone
7	34.2 m	417.4	Lam. mudstone in 2-4 cm beds shale in 1-2 cm beds shale << mudstone becoming shaley in upper 15 m
Kanguk E.S. 8	51.5 m	468.7	SS; vfg; flaggy; yellowish-brown weathering; paral bedding w/ carbon laminae and rare 1 cm coals + mudstones fossil wood frags common top 7 m ⊼ very flaggy at 25
9	15.2 m	483.9	Dk gray chippy shale, no silt POLLEN 8540c
10	22.7 m	506.6	SS, flaggy w/ one massive (1 m) unit at 15 m lots of commin. plant frags + carbon good scour at base of massive sand unit

11	18.2m	524.8	Poorly exposed shaley dk brownish gray mudstone w/ thin lenses of flaggy brownish ss
12	272.8m	797.6	Siltstone; rusty weathering very dk gray; flaggy; carbonaceous; CA to vfg ss at 45m; ^; paral. lam silty at 48m.
			unit as a whole alternates w small lenses of fine sand and silt
			– at 182m CA to clean vfg ^ ss w/ load casts forms shoulder
			– at 212m massive, cliff-forming ^ ss, parallel lam; at least 6 form a 10m band; plant frags lt gray vfg arenite; cliff formers
			– interference ripples at 257m
			– shoulder forming ss, vfg, interference ripples load casts, sands up to 30 cm
13	18.2m	815.8	Partially covered gray shale unit becoming flaggy silt at 8m Pollen 8540a
14	7.9m	823.7	lt-yellow-brown med sand flaggy for basal 4m massive for top 3m great drag marks; ^ Paleocurrent from drag to NW cliff-forming – orthoquartzite
15	10.6m	834.3	dk gray shale for 5m CA to INTBD vfg ss + shale in 1-2cm beds; gulley former
16	15.2m	849.5	yellow-brown ss; 10-40cm parallel beds; ^; irregular marks; forms shoulder
17	45.5m	895	Partially covered swale-forming dk gray shale
18	18.2m	913.2	vfg dirty ss; ^; load casts flat lam; carbon on lam. parallel bounded 20-30cm units interference ^ INTBD w/ carb units on 1m spine forming ss
19	45.5m	958.7	flaggy, med gray silt to vfg ss weathers to yellow-brown; becomes massive w/ .5m siltstone; dk shale between 20m - 30m

19 contd			top 6m is a cliff-forming ss ^; epsilon units; sand beds to 60m Channel Unit wood and sticks on bedding plane
20	23.6m	982.3	1.5m coal C↑ mudstone → siltstone w/ parallel lam. interbeds tan to brown weathering beds thicken up increasing silt and ss up topped by 3m ^ ss ledge Pollen 8540e above coal
21	59.7m	1042	covered unit, probably shale at 30m unit is visible and has coarsens to flaggy interbeds of rippled ss and siltstone -top ~15m contains 3 flaggy ^ ss beds 4m 3m 2m Unit 21 as a whole C↑
22	78.7m	1120.7	very dk gray carb shale parallel lam Pollen 8540f (C↑) some rusty beds; brown flagstones above 15m, Top 30m is a flaggy ss which forms a shoulder
23	15.2m	1135.9	dk gray shale
24	19.7m	1155.6	ss flagstone
25	36.4m	1192	dk gray shale Pollen 8540g
26	7.9m	1199.9	ss flagstone, brown weathering low shoulder
27	16.7m	1216.6	Black shale w/ flaggy silt interbeds – forms SWALE
28	21.5m	1238.1	flaggy to massive sand w/ 2m shale split lower sand is (trough x-bedded) and forms a prominent nose upper sand is massive and parallel laminated
29	60.9m	1299	Very dk gray shale Pollen 8540h unit well exposed in cutbank otherwise a rubbly swale -silty interbeds towards top up to 8m thick at 40m, 55m, and 58m shale → 2m coal at top.
30	15.2m	1314.2	Massive cliff-forming ss (on w side of creek) fe-stone nodules; load casts into coal; ; yellow-tan

30 (cont'd)			organic trash on bedding pl. lots of plant frags in upper 3m grain size C↑ from f to m
31	15.2 m	1329.4	dk gray shale
32	28.2	1357.6	flaggy ss; fine gr. paleocurrent from drag the the N (upstream) Very low angle x-beds sulfide nodules Plat. raynoldsii? unit forms 2 low but prominent ridges and a distinct 2ft. waterfall two units separated by a dk shale split
33	121.2 m	1478.8	POLLEN 8540; Dk gray chippy shale interbedded with rippled, pink, flat, lam ss w/ org rich layers shales ave 20 m sands ave 4 m ss increase in # upwards at 75m unit becomes very sandy w/ 4 ridge formers on east side of creek sands 1-3 m each, ^, dirty f-m gr., carbon trash shales 3-4 m thick
34	45.5 m	1524.3	Organic rich dk gray shale C↑ to mudstone POLLEN 8540J at 3m mudstone 6-12 m 12-18m ^, pink, ss, tabs 18m 1/2m coal 18m-top interbedded mudstone and shales w/ lenticular downcutting 3m yellow-brown channel sand at 20m 2-40cm ss near top of sec.
35	2 m	1526.3	Massive yellow channel ss Very lenticular from 2-5m thick clay galls at base trough x-beds; ^; med gr.
36	14.8 m	1541.1	INTBD thin coals, shale and minor lenticular ss weathers to swale upper coal maybe as large as 4m
37	10.6 m	1551.7	Massive yellow cliff-forming ss low angle x-beds carbon trash ripples
38	26.4 m	1578.1	shale split
39	7.6 m	1585.7	Massive yellow-brown cliff-forming ss, undulating beds cliff on east side of creek

39 Wall Sand
40 Splay mem

40	60.6 m	1646.3	dk gray-brown shale swale-former, brownish smooth slope on east side of creek
41	52.1 m	1698.4	Unit of alternating - lenticular channel sands with epsilon units, parallel lamin. ripples, carbon trash - coals up to 2m - laminated mudstones - splay like sandstone basal SS is 3-5 m thick
42	42.3 m	1740.7	- as unit 41, basal sand is about 15m, then interbeds of sand shale coal Coal near top is 1m

Change from tape to Jacob Staff dip is 82°S

43	28 m	1768.7	dk gray shale, covered in swale (dip 80-64S = $\bar{x}$ = 72°S)
44	26 m	1794.7	shale becomes exposed in cut bank; interbeds of coal (minor) and mudstone C↑ w/sand POLLEN 8540L 1979 Megafossil Locality Botrea / Avehloites affinis
45	28 m	1822.7	grungy ss unit, slumpy and covered; generally reddish stained ss 2-3 m thick with undetermined interbeds
46	76 m	1898.7	grungy ss and carb rich mudstone interbeds; irregular bedding good exposure starts at 16m well exposed on west side of creek ↓ interbedded coals (to 1/2 m) dark shales and thin rare sandstones. dip 40°S at 24 m 1 m sand at 30 m 3m lentic sand at 46 m dip 35°S at 64 m 3m lentic sand at 65 m trough x-beds, conglomerate Pollen 8540 m at 72 end of base of ss
47	10 m	1908.7	Lenticular yellow-brown med-sand channel Varies from 4-10 m carbon trash at base

48	12 m	1920.7	partially covered swale containing dk gray shale/lignite
49	22 m	1942.7	Alternating dk gray shale, mudstone, thin lignites, and some minor 1-2 m light yellow brown to pink sandstone. coarse zone in middle - basal 6m is sandy. Pollen 8540n at 20m

TOP COVERED BY ROCKY DELTA SLOPE

Total thickness 1942.7 meters
6410.9 feet

1942 • 8540n
1900 • 8540m
1800 • 8540L
1700 ?8540K
1600
1500 • 8540j
1400
1300 • 8540i • 8540h
1200 • 8540g
1100 • 8540f
1000
900 • 8540e
800 • 8540d
700
600
500 • 8540c
400
300 • 8540b
200 • 8540a
100
0 meters

SPLAY SAND
WALL SAND

Section 8540
July 29, 1985
14 pollen samples
1942 meters

KANGUK Fm

July 30, 1985 Leo + I

Section 8542 in West Creek, Strand Fiord, Eureka Sound formation

Section starts at the fork (upper) of west creek. Basal unit is a thick sandstone at the fork of the creek. N.B. West creek is clear and drinkable unlike East creek which is very muddy.

(conversion to meters based on 1m = 3.3ft) Measured by 50ft tape

unit no.	thickness	total	description
1	15.5 m	15.5	pinkish to yellow-brown weathering fg ss w/ climbing ripples, ^, parallel lam. dip 90°, carbon bedding plane. Cliff at fork of west creek
2	94.5m	110	Partially covered swale sequence of dk gray shaly lignite (up to ½m), and flaggy sands and mudstones. 3m coal at top. Sand below coal contains a nice uncollected megafossil flora in a rooted platy fine sand. Cercidiphyllum "Betula" or "Alnus"

for purposes of argument unit #1 will be TAKEN TO = UNIT 3 of 8540

TRUE DIP 70°S

Measured from here on with Jacob's Staff

80

77 18N 80 32W

3	3m	113	Massive yellow-brown ss ^, fine gr, climbing ^ cliffformer
4	60m	173	Sequence of thin flaggy ss; thin punky mudstones, thin coals. Pollen 8542a at 24m. 3m ss at 42m
5	91.3m	264.3	typical ss, yellow tan 2.5m thick; ^; parallel bedding. It begins a sequence of similar sands, dk gray clay, shale and some coal. Similar to unit 4. - the platy ss have roots up to 3cm thick - thin coals up to 50cm one such coal at 31m unit largely covered from 42-91.3 2m coal at 86m forms a delta-like projection into the stream

6	30.5m	294.8	flaggy, thin bedded (10-20cm) med gray ss; fg; tan weathering rippled w/ carbon trash INTBD w/ thin mudstone and increasing coals upwards well exposed in cut bank Pollen 8542b at 6m Vitrinite 8542c at 6m Plat raynolds becomes coaly to top with a 1m coal in top 5m
7	27m	321.8	Coaly sequence of dk gray carb shale with 3-50cm to 2m well exposed bituminous coals near base. unit as a whole is poorly exposed
8	5m	326.8	typical ss channeled with 8 ft. fossil log at base, ^ carbon trash etc.
9	33m	359.8	shaley covered unit interbedded shale, mudstone, minor coal and minor ss. poorly exposed except for the top of the sequence
10	26.2m	386	big coal, well exposed in cut-bank of stream, some small sand, mud, and fe-stone interbeds; becomes shaley at 8m with 10-30cm sandy stringers POLLEN 8542d at 12m
11	5.8m	391.8	typical ss forms shoulder
12	18m	409.8	Coal with thin sands in upper part.
13	23.3m	433.1	Slabby ridge forming ss lt gray, ^, worm tubes vfgrained, maybe lined roots wood Good veg flora 8542e Acer sp.
14	21m	454.1	Swale of dk gray clay E^ to coal at 15m
15	16m	470.1	Sequence of ss w/ big shale split. Basal ss is 4m; yellow-brown rippled; wood fragments flat laned.

16 16.8 m 486.9 covered at base, prob mudstone FA to coal at 9.2 m. Coal is papery and not as good as other layers.

17 205 m 691.9 INTBD punky ss w/ rusty shale + mudstone
ss - .25-1.50 m thick
much rooting - SOIL?
load casts
Climbing ^
Some thin fe-stones and shales
wood and plant frags
Pollen 8542 f at 3m
shales to 3m

LUNCH

dip changes to 65°s

Pollen 8542g at 98 m in mudstone

Pollen 8542h at 160 m

much interbedded mudstone and shale throughout unit

18 189 m 880.9 Sandier version of unit 17
INTBD .5-3m ss; shales and minor coal
exposed as ridges on west side of creek

dip 50°s (at 36 m)

Sand ~ 65% of unit
lt gray weathering
ss have big roots
plant-rich fe-stone
trough x-beds
med grained
epsilon units
Metasequoia cones
Cercidiphyllum
fossil nut 8542i
Pollen 8542i at 60m

Coal at 90m
dip 55° at 90m
Pollen 8542j at 106.5m

19 40 m 920.9 Pollen 8542K at 2m
carbonaceous unit starts with 3m dk gray shale + mudstone then 1-3 m lenticular λ ^ splay channel sand. then a swaley carb shale w/ shale INTBD some fe-stone, lts sand.

20	33.5m	954.4	vfg to fg ss in .5-1m beds much fe-stone, carb shales shales, minor Coals up to 1m Crevasse splay sequence Pollen 85421 at 25m
21	49 m	1003.4	Coal unit w/very lenticular, platy shale, sandstone lenses up to 5m thick channels in swamp dip 58° Bituminous Pure Coal by 26 m 8542 m Pollen 8542 n Vitrinite Coal forms steep valley wall — beds above coal are thin platy crevasse splay deposits.
22	85m	1088.4	INTBD platy ss, carb mudstone and minor coal. Unit is mainly a lt yellowish-tan weathering platy ss which forms rubbly shoulders. In the cliff above unit 21 it is well exposed.
			It becomes well-exposed again in the cut bank at 62m Pollen 8542o at 68m apparent dip is 25's true dip is 50's thin lignite up to 1m
23	2.5m	1090.9	Coal, prominent in cut bank.
24	5.5m	1096.4	Platy mudstone ↑ to yellow-brown platy ss
25	10.5m	1106.9	Coal which becomes stream bank at mouth of west creek, here is prominent slope former, overlain by platy splay deposits which are also well-exposed at mouth of west creek.

OFFSET IN SECTION TO SLOPE AT MOUTH OF ~~30~~ WEST CREEK

On slope above coal at mouth of W. Creek

26	8.5m	1115.4	Thick very prominent cliff of thinly bedded ss splays massive towards middle (beds up to 2m) thinner at base (~10-20cm) overlies thick coal in stream bed
			on the slope on west side of west creek this unit is tundrified and sloping
27.	54m	1169.4	INTBD coals, shales, and platy ss, tundrified on slope dip ~ 10° N one or two 1-2 m coal intervals Acer sp.
28	10m	1179.4	Flaggy ss, forms a shoulder dip 30° N Cercidiphyllum
29	26.9	1206.3	INTBD unit as in unit 27 apparent dip is 5°S
			Pollen 8542p at 25m In split in 2m coal
30	4.5m	1210.8	platy ss
31	10.5m	1221.3	tundrified shaley unit
32	41.5m	1262.8	Slabby ss INTBD w carb shale and mudstone some coal ½-1 m. ss is occasional fe-stone

In. Coal at top is youngest bed in the E.S. fm. in Strandfjord syncline

TOP OF section at top of hill

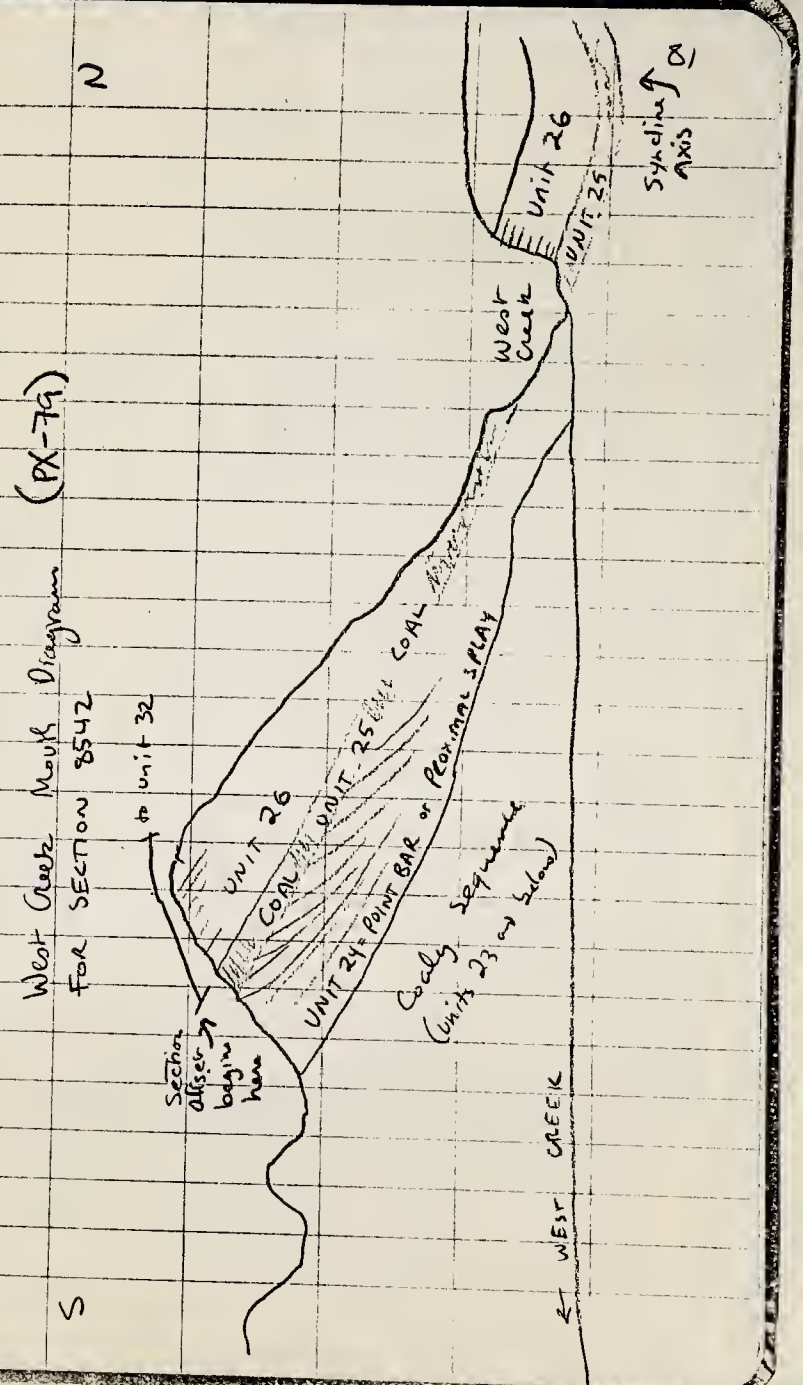
Total thickness 1262.8 m
4167.24 feet

finished measuring by 5:30 pm
walked to East Creek by 6:30 pm
walked to Kangok river by 10:30 pm

36 hours 21 miles
3205.5 meters of section
10578.15 ft of section
2.0034 miles of section

July 30, 1985

Section 8542 West Creek

		Pollen	Other
	1300		
	1200	8542p	
	1100		
COAL MEMBER	1000	8542o	
		8542m	8542n (vitrinite)
		8542l	
	900	8542k	
	800	8542j	
		8542i	8542i (fossil not)
SPLAY MEM	700	8542h	
	600	8542g	
	500	8542f	8542e (mega flora)
	400	8542d	
	300	8542b	8542c (vitrinite)
	200		
	100	8542a	
WALL SAND MEMBER	0 meters		

13 pollen samples
1262.8 meters.